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ABSTRACT

This survey was the first systematic attempt to identify use of computer assisted instruction (CAI) in schools for the deaf. Eleven of the 50 states surveyed (46% questionnaire return rate) identified CAI systems in 34 schools for the deaf with a total of 408 terminals; elementary and secondary schools for the deaf were the predominant users. Of special note is the indication that schools for the deaf are not time sharing between administrative and educational uses--dedicated instructional systems are the rule, and 28 of the 34 computer systems are used strictly for CAI. (Author/CMV)

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A NATIONAL SURVEY OF THE USE OF COMPUTER ASSISTED INSTRUCTION IN SCHOOLS FOR THE DEAF

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FINAL REPORT

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ABSTRACT

This survey was the first systematic attempt to identify computer-assisted instructional use in schools for the deaf. Eleven of 50 states surveyed identified CAI systems in 34 schools for the deaf with a total of 408 terminals. Elementary and secondary schools for the deaf were the predominant users. Of special note is the indication that schools for the deaf are not time sharing between administrative and educational uses. Dedicated instructional systems are the rule. Twenty-eight of the 34 computer systems are strictly used for CAI.

ABOUT THE AUTHOR

Dr. James R. vonFeldt serves the National Technical Institute for the Deaf as a specialist in CAI activities. He supports faculty CAI training through a specially designed training process (SKILL) which is instrumental in CAI course development, evaluation and research. He has designed and implelmented new computer based instructional systems such as the "Interactive Computer Based Video Tape Replay (TV)System" and has assisted many schools in implementing CAI to meet their needs. NTID currently provides CAI by way of IBM, SIGMA, WANG and (in February 1978) CDC PLATO . He directed an NTID study of the CCC system. His education began at the University of Kansas followed by a masters degree (MS) from the University of Illinois (Urbana) and doctoral degree from the University of Missouri (Kansas City). His work experience spans civil engineering, education and computer technology prior to joining the National Technical Institute for the Deaf in 1971.

Overview

No data was available in 1976 to describe the use of computers for instruction of deaf children. However, CAI was shown to have a significant growth rate in public schools as was shown by Dr. Korotkin et. al. in the national surveys of 1970 and 1975. Indications that growth was occurring in education for the deaf was evidenced by the formulation of a special interest group for deaf education within the Association For the Development of Computer Based Instructional Systems (ADCIS) and by the prototype experiment in reading drill and practice led by Dr. Patric Suppes.

A data based description of the state of the art of CAI in schools for the deaf was clearly needed to established a base line for planning as well as to develop and identify trends.

Purpose

The purpose of the survey was to establish a preliminary data base describing the use of computers for education of deaf in the United States. Special attention was paid to computer assisted instruction because of its potential to meet remedial and instructional needs on an individual basis.

Survey Design

In the spring of 1976 a questionnaire of 10 items was designed. The design was based on a previous questionnaire developed in 1973 at NTID BY Dr. vonFeldt which was sent to a limited number of known CAI installations at schools for the deaf. After testing and revision, the questionnaire was sent to three populations:

1. Schools for the deaf listed in the 1976 American Annals For The Deaf.
   a) All schools showing a population of 100 or more students.
   b) In states that had less than 100 students, surveys were sent to the three largest schools.

2. Membership of the ADCIS Special Interest Group (SIGED).

3. Schools for the deaf that support data processing curricula.

A total of 237 surveys were sent to 50 states. One hundred eleven (111) were returned (46%). Thirty four (34) computer systems for education of the deaf were identified.

Analysis of Data

The survey data was graphed and is presented here question by question with comments.

1. Do teachers have access to a computer at your institution?

237 Surveys sent

111 Surveys returned
(46% returned)

34-Yes 77-No

Locations of computer systems used for instruction of the deaf in the United States

FIGURE 1

Figure 1 shows the location of each of the 34 schools for the deaf responding "yes" to question 1. In general, the northeast shows greater density by state; however, Texas and California exceed other states in number of installations and terminals.

A list of states, installations, and terminals is as follows:

	STATE	SCHOOLS	TERMINALS
1.	Texas	11	100
2.	California	5	76
3.	Massachusetts	3	14
4.	Washington, D.C.	3	100
5.	New York	2	19
6.	Pennsylvania	2	34
7.	Ohio	2	8
8.	Illinois	2	37
9.	Minnesota	2	5
10.	Oklahoma	1	4
11.	Florida	1	11
		34	408

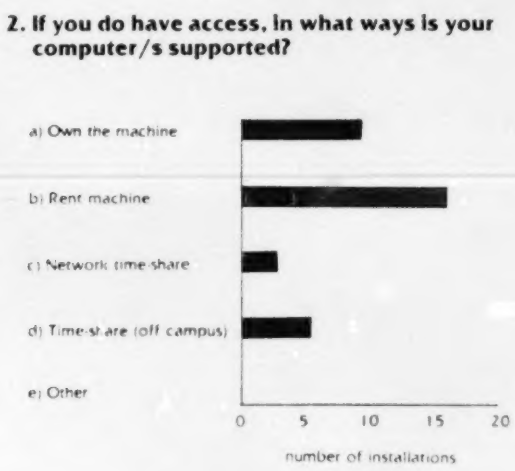


FIGURE 2

Figure 2 shows rental of computer systems dominating purchase. This reflects the kind of systems being used and the marketing strategy being employed at that time (see figure 4).

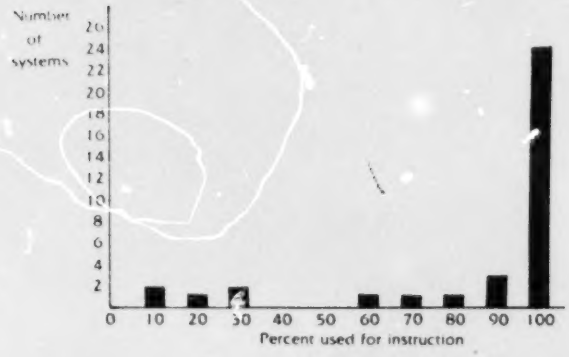

3. Estimate the allocation of your machine/s for instructional uses (in percentage of use).
a. ____ percent of our machine use is for instructional purposes.
Number of systems
0 2 4 6 8 10 12 14 16 18 20 22 24
0 10 20 30 40 50 60 70 80 90 100
Percent used for instruction

FIGURE 3

Question 3 was broken into two parts to determine not only the percentage of time that systems were being used for instruction but also the strategy.

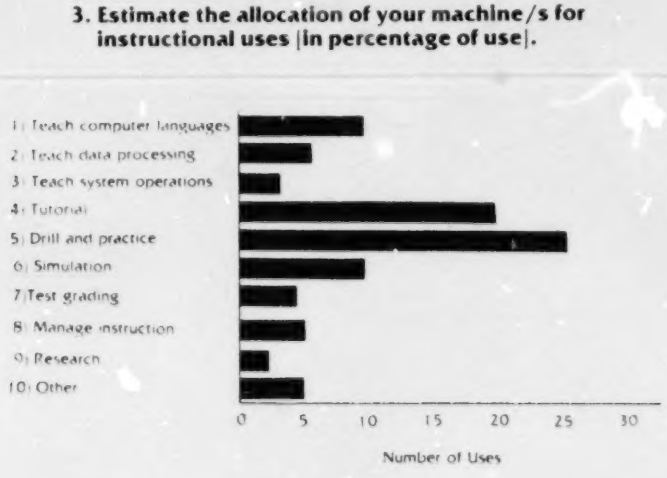

3. Estimate the allocation of your machine/s for instructional uses (in percentage of use).
1) Teach computer languages
2) Teach data processing
3) Teach system operations
4) Tutorial
5) Drill and practice
6) Simulation
7) Test grading
8) Manage instruction
9) Research
10) Other
0 5 10 15 20 25 30
Number of Uses

FIGURE 3A

Figure 3a shows that data processing use (1-3) as well as research and other utilization (9-10) are far behind CAI core activities (4-8) in percentage of use. This too is a deviation to trends shown in CAI at the public school level. However, the predominance of drill and practice and tutorial strategies would be expected knowing the nature of learning problems in education of deaf.

4. Describe your machine/s [name, model, periferals number of terminals, etc.].

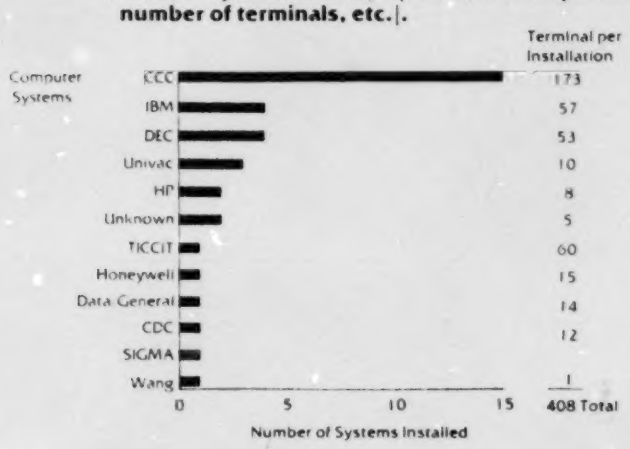
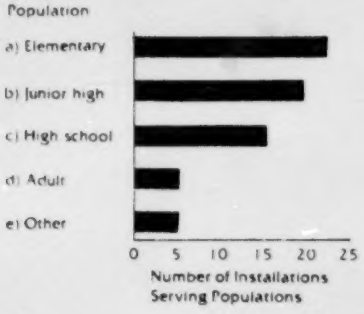


FIGURE 4

As can be seen in figure 4, CCC systems far out number systems placed by other companies. As a point of clairification, CCC is not a computer company per se. It is a company which rents or sells a turn-key system that provides individualized instruction in math, reading and language arts. Unlike other companies represented in figure 4, the CCC system computer does not allow the user to develop lessons.

5. What is the age group of your student population?



Others:
College (2)
Tech-College (2)
Preschool (2)

Note:
29 of 34 responding marked multiple levels of students using the comp...er

FIGURE 5

As would be expected schools for the deaf serve a wide population of students. Most schools indicated they served at least two distinct populations.

6. Do faculty at your school design and develop CAI lessons?

No	22	67%
Yes	12	33%

Faculty Training?

No	22	67%
Yes	12	33%

Language used	
BASIC	5
IDAF	2
ASET	2
APL	1
FORTRAN	1
GNOS	1
PILOT	1
SCHOLAR-T	1
TACL-CW II	1
TICCIT	1
Coursewriter III	1

Training	
1. Proctor Training	2
2. CAI Orientation	7
3. Course Development	12

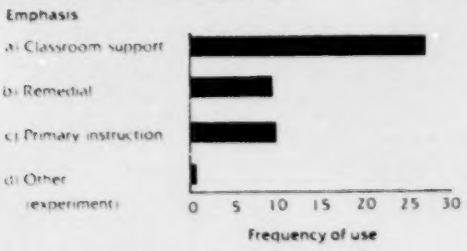
Note: Most installations offering training had orientation and course development training.

FIGURE 6

The data in figure 6 excludes all of the CCC systems by definition. Faculty training is offered to some degree at each installation which supported a general purpose computer system (general purpose as opposed to turn-key). The computer language BASIC is used most. NOTE: The "TUTOR" language required for CDC PLATO was ommitted from the figure.

Since general systems do not provide instructional programs, the users (usually teachers) must develop their own materials. Each vendor supports a library of instructional materials; however, general utilization has been poor for many reasons.

7. If you are using the computer as a CAI instrument - what is the main emphasis? (27 of 34 were)



Note:
There was a high incidence of multiple use reported

FIGURE 7

The data graphed in figure 7 shows classroom support (support of ongoing classroom instruction) to be the dominant application. It must be noted that 27 of the 34 responding schools indicated multiple uses.

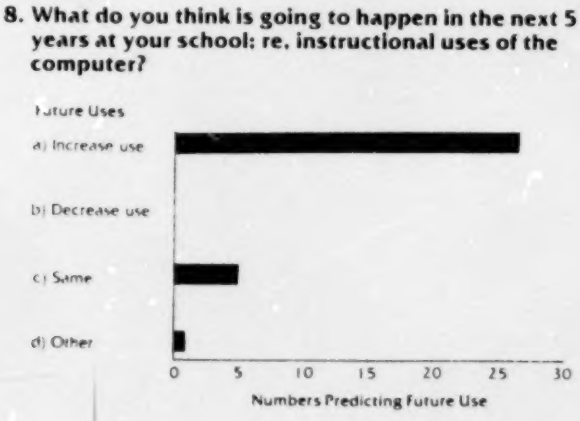


FIGURE 8

An optimistic prediction for future growth was cast by 29 of the 34 respondees. Five indicated that the status quo would be maintained. Clearly, the users feel that there is positive value.

The 9th question on the questionnaire required the respondee to list benefits.

9. What do you feel are the benefits of instructional uses of the computer at your school?

The question provided an open end format for the user to respond. Fourty-eight categories of benefits were identified. The top three categories marked by all 34 respondees were:

"Provides Individualized Instruction"
"Provides High Motivation"
"Provides More Teacher Time for Working With Students"

The 10th and last question asked for a list of problems in using computers for instruction of deaf.

10. What are the problems of instructional uses of the computer at your school?

Again the format was open ended. Twenty-one categories of problems were listed. The top of the list included:

"Teacher Needs":

a) to develop lessons
b) training for lesson development
c) time for lesson development

"High Cost of Computers"

Survey Results

The results of the survey show a strong start towards the use of the computer and significant growth in the three-year period (1973-1976). Eleven of the fifty states surveyed have implemented computer based instruction. The survey identified 34 systems with a total of 408 terminals. A very small percent was allocated for computer science activity.

Most computer systems (16) were turn-key systems that provided drill and practice in math, reading and language arts. However, a surprising number of systems were purchased (9). The remaining systems (9) utilize various time sharing systems.

Mini, intermediate and large computer systems were represented. Specifically, there were specially designed instructional systems and general purpose systems adapted for instruction. Of special note, is the indication that the instructional systems were not generally shared with other applications. Twenty-eight of the 34 systems were used strictly for CAI.

Mini-computers represented 20 of the 34 systems. One company, Computer Curriculum Corporation, dominated the scene with 16 of their systems placed in schools for the deaf (173 terminals). The next nearest competition was IBM and DEC with 4 systems each and UNIVAC with 3 (a total of 120 terminals). The fundamental difference between CCC's system and all the others was that it provided a turn-key system with ready made math, reading and language arts curricula. It required no technical expertise to maintain and had no capacity to develop new material.

For those developing their own material, two statements can be made. First, BASIC appeared to be the predominant language used. Secondly, instructional computer applications were occurring in a wide and diverse range of subject areas.

The survey showed that educators for the deaf were entering into the applications of computers for instruction in a radically different way than was experienced by hearing public schools and higher education. The normal sequence of starting with research, then administrative, then computer science, and finally, to CAI were circumvented. Educators for the deaf appear to have gone directly to CAI as shown by 63 CAI applications, 18 computer science, 5 research, and 7 administrative.

As would be expected of education for the deaf, the population served included elementary through highschool. Here again major differences occurred when compared to public education across the nation. Schools for deaf are serving the entire spectrum whereas public schools separate and focus upon single populations within an environment. Few, but significant computer applications exist at institutions for post highschool deaf.

The respondee's outlook for the future was optimistic and extremely positive. They cited many experiences substantiating observed student and teacher benefits. Almost all (27) predicted growth in the next five years.

Problems that were cited most often included: 1) the needs for more terminals 2) capacity for course development 3) training for faculty 4) support for lesson development 5) access to lessons developed at other schools for the deaf (on other computer systems).

Conclusion

There has been a rapid growth in the implementation of computers for instruction of deaf in a very short period prior to 1976. Observations by attending faculty and administrators are very positive about their experiences. However, no one computer system has proven that it can provide all of the needs of a school for the deaf. Not all appropriate applications are yet known. Mini-computers appear to be making a significant impact in CAI for deaf.